

March 25, 2014

Mr. Ken Thiessen
Oregon Department of Environmental Quality
2020 SW Fourth Avenue, Suite 400
Portland, OR 97201-4987

**Subject: Response to DEQ Comments
Proposed Surface Soil Sampling – DU-6
Willamette Cove Upland Facility**

Dear Ken:

This letter provides the Oregon Department of Environmental Quality (DEQ) with a response to the comments received on the Willamette Cove Upland Facility *Proposed Surface Soil Sampling – DU-6* (Apex, 2014). The comments were provided to the Port of Portland (Port) in a letter from the DEQ dated March 20, 2014. The DEQ comments are repeated (in italics) followed by the Port response.

- 1) *Sampling Methodology. As noted in a previous email to you, DEQ recommends that follow-up sampling in DU-6 follow the incremental sampling methodology (ISM) used for the investigation effort that identified elevated dioxins and other contaminants in the decision unit. The reason for recommendation is two-fold: to maintain consistency with (recent) area-wide upland sampling efforts, and because use of the ISM protocol is expected to result in the generation of contaminant data that are more representative.*

Response. The Work Plan was prepared to better define mercury and dioxin/furan hot spots in DU-6. As previously discussed, ISM sampling is not well suited for defining hot spots. Consequently, the proposed composite sampling approach will be implemented using DEQ's recommendations for composite sampling discussed below.

Discrete surface soil samples will be collected from DU-6 at the same locations as the incremental sample locations that constituted sample DU-6. This should address consistency issues.

- 2) *Significance of DU-6 Hot Spots. We agree that additional delineation within DU-6 is prudent given the high concentrations of dioxins/furans detected in the Central West Parcel during recent ISM sampling. Please note, however, that dioxin concentrations (based on 2,3,7,8-TCDD TEQ's) in all of the upland decision units likely represent (lesser) hot spots for ecological and/or human health.*

Response. Noted.

- 3) *Status of FS Review. Please note that, in reviewing the DU-6 Work Plan, DEQ staff have not completed review the draft Feasibility Study submitted on your behalf and dated February 12, 2014.*

Response. Noted.

- 4) *Decision Criteria. Absent from the memo is any discussions of data quality objectives or decision criteria related to the sampling. Please discuss, including what criteria will be used in potential follow-up sampling using archived soil.*

Response. The purpose of the sampling is to define mercury and dioxin/furan hot spots in DU-6. This will be accomplished by an iterative analysis of composite and discrete samples. The following decision criteria will be used for selecting chemical analyses.

- The initial eight composite samples (described in response to Comment #5) will be analyzed.
 - Based on the principle of conservation of mass, these results will be evaluated to determine the range of potential concentrations for the discrete samples consistent with the ISM results and the composite results.
 - The range of potential discrete sample concentrations will be used to select follow-up analyses as demonstrated by the following examples.
 - Case 1: All composite results are approximately equal to ISM result. This indicates that the COC is relatively uniformly distributed throughout DU-6 and no further analyses would be completed.
 - Case 2: One composite result is seven to eight times the DU-6 ISM result (for seven-point or six-point composite, respectively) and the other composite results are similar to (or less than) the other decision unit results. The hot spot(s) are confined to the area defined by the one higher composite result. Each discrete sample from the higher composite would be analyzed.
 - Case 3: Four of eight composite results are approximately twice the ISM result and the other composite results are similar to (or less than) the other decision unit results. The hot spots are confined to the areas defined by the four higher composite results. The discrete samples from those areas would be selected for follow-up analyses; or, new composites, comprising approximately half of each of the higher relative prior composites, would be selected for follow-up analyses. This iterative process would continue until the hot spot areas are defined.
 - Case 4: Other. A similar process would be used for any other result from the first round of composite sampling.
- 5) *Composite Sample Units. Since the distribution of contamination is not known, and given concerns about upland soil being a source of contamination to the riverbank and river, we recommend breaking each unit into two (one riverward and one upland subunit). This would provide more information on the distribution and has the advantage of smaller composites which is preferred when incremental sampling is not performed.*

Response. The Port agrees with this approach. The attached figure presents the revised sample composites. The initial analyses include the eight composites (rather than four) with four riverward and four upland.

- 6) Composite Size. *Composite are is made up of 12-13 sampling locations. The sampling number should be the same between each unit. In general, we believe the soil volumes and decision unit sizes are too big for composites without using ISM methods, and thus recommend splitting the proposed decision units as described above.*

Response. As discussed in response to Comment #1, to maintain consistency with the prior sampling, the subsamples to be used for compositing will be collected from the same 50 locations as the incremental samples collected during the ISM samples. Given that constraint, we selected the composite subsample number to be as equal as practicable. As noted above in the response to Comment #5, the Port revised (split) the composite sample areas per the DEQ's recommendation.

- 7) Sample Compositing. *If ISM is not to be used, we recommend that field (sampling) and laboratory (processing/compositing) protocols be followed as closely as possible to maximize the representativeness of the samples. Field compositing is discouraged given the potential for incomplete mixing, etc.*

Response. The compositing will be completed by the laboratory rather than in the field (as recommended by the DEQ).

- 8) Analyte List. *Other contaminants (including copper and PAHs) are notably elevated in the Central West Parcel and may be present above hot spot concentrations within DU-6 subunits. Please consider adding (non-mercury) metals and PAHs as analytes.*

Response. The Port intends to focus on dioxins/furans and mercury in the proposed sampling. These are the only COCs with concentrations in the ISM sample that are not consistent with the known hot spot areas on DU-6.

- 9) Analytical Methodology.

- a. *In addition to ISM sampling methodology, previous laboratory protocol included increased extraction for metals (to 10 grams) using five 2-gram aliquots digested individually (using a sub-aliquot from each digestion to obtain the 10 grams). The analyses for dioxins/furans and PAHs utilized a 30 gram sample. It is unclear from this memo what methodology will be used in this proposal. Please discuss.*

Response. The Port's intention is to create composite samples for dioxin/furan analysis that will utilize a 30 gram sample, consistent with prior sampling. Samples will be analyzed for mercury using standard laboratory protocols.

- b. *The most recent ISM dioxin / furan sampling indicated samples above the calibration limit. Were these samples re-analyzed, and are alternative methods being employed in the proposed work to fall within calibrations limits? Please discuss.*

Response. The samples that were above the calibration limits were not re-analyzed. This was identified in the data quality review which concluded that the resulting data are likely biased high. The calibration range issue will be discussed

with the laboratory prior to the next round of sampling. DEQ will be provided the laboratory resolution to this issue prior to sample analysis.

- c. *Diphenylether Interference: During the previous ISM sampling event, this was noted to be a problem. Every effort should be made to properly resolve this issue in the next round of sampling. This would include appropriate clean up methodologies and the reporting of potential concentrations of the diphenylethers since the most recent ISM sampling indicates these chemicals are potentially present over large exposure areas.*

Response. The diphenylether interference will be discussed with the laboratory with the intention of resolving this issue in the next round of sampling. DEQ will be provided the laboratory resolution to this issue prior to sample analysis.

Please call me at (503) 415-6325 if you have any questions.

Sincerely,



Dwight Leisle
Environmental Project Manager

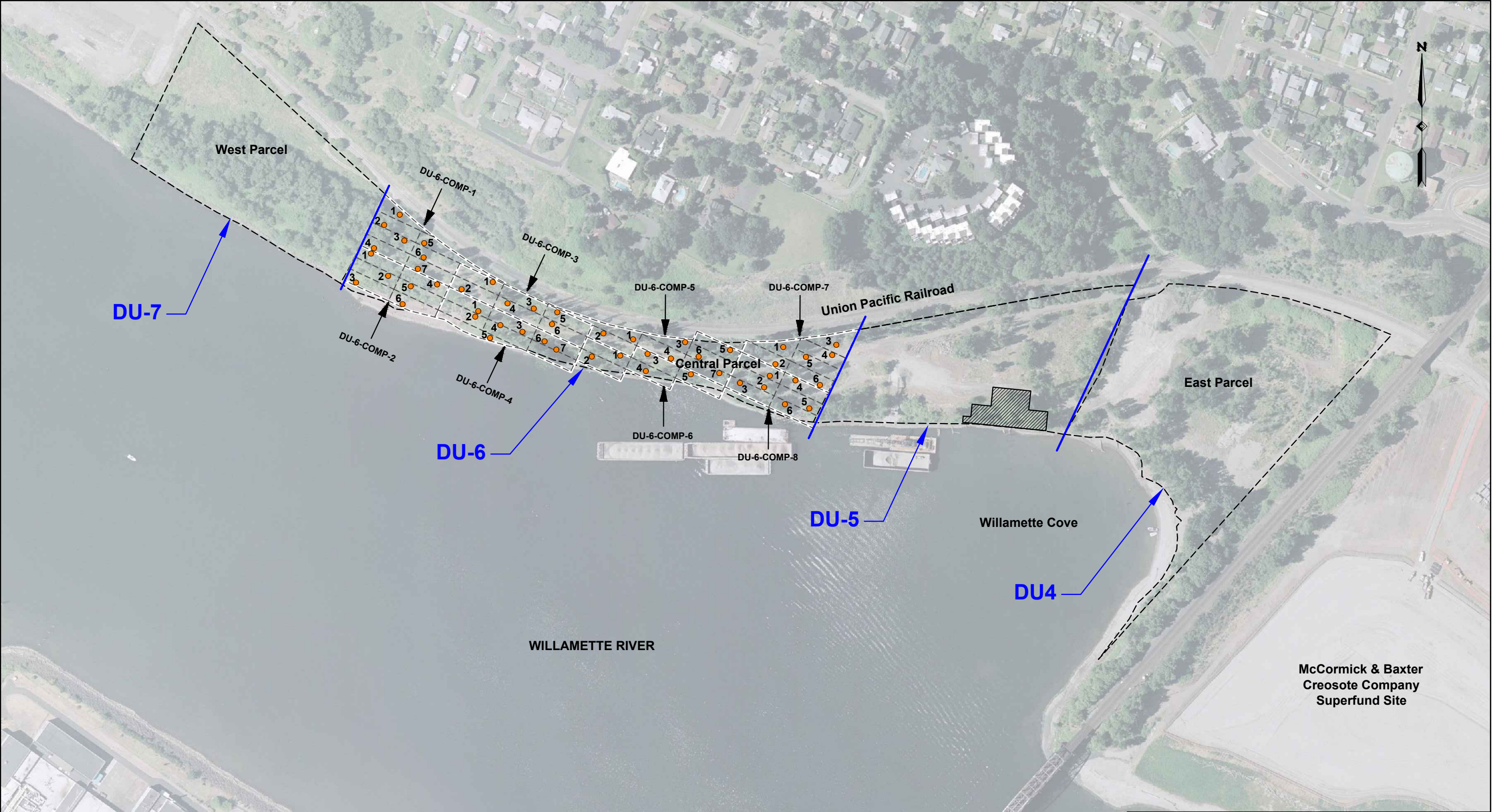
Attachment:

Figure 3 - Proposed Sampling Plan

Reference:

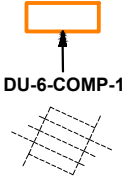
Apex, 2014. *Proposed Surface Soil Sampling – DU-6, Willamette Cove Upland Facility*
Portland, Oregon, ECSI No. 271. March 19, 2014.

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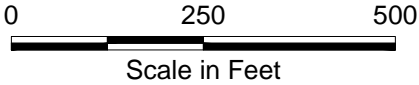


Legend:

- 1 ● Proposed Sample Location and Number
(Note: Sample locations correspond to DU-6 incremental sample aliquot locations)
- Historical Wharf Road Incremental Samples
- Site Boundary



- Proposed Composite Sample Area and Number
- Previous Incremental Sample Grid



Proposed Sampling Plan

Proposed DU-6 Surface Soil Sampling
Willamette Cove Upland Facility
Portland, Oregon

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number 1056-03
March 2014

Figure 3

Source: Base map prepared from a 2005 aerial photograph.